

Task Scheduling Approaches Based on Weighted Round Robin Algorithm in Cloud Environment

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Abstract— Cloud computing uses the concepts of scheduling and load balancing to move around tasks to underutilized VMs for effectively sharing the resources. The scheduling of the tasks in the cloud computing environment is an irrecoverable restraint and hence it has to be assigned to the most appropriate VMs at the initial placement itself. Practically, the arrived jobs consist of multiple tasks and they may execute the tasks in multiple VMs or in the same VM's multiple cores. Also, the jobs arrive during the run time of the server in changeable random intervals under various load conditions. the Objective of this work is to introduce and evaluate the proposed scheduling and load balancing algorithm by allowing for the capability of each virtual machine (VM), the task length of each requested job, and the of multiple tasks.

Key words: Virtual Machine (VM), Cloud Computing, Weighted Round Robin Algorithm

I. INTRODUCTION

The term cloud computing is a model that enabling ubiquitous, convenient on demand network for access to share a pool resource like servers, storage, applications and services these are rapidly provide and release with limited service provider interactions [1].cloud supports some special characteristics like elasticity, resiliency, multi tenancy, scalability, maturated usage .cloud computing consists of two types of models that are deployment model and service model. Each model has its own sub services are providing for users[3-4]. A task scheduler can be adopted its own scheduling strategy for changing the environment.

the task scheduling is a typical problem for assigning a task to a particular virtual machine with consisting of those properties are suitable for the specific task .the task properties like file size, total number of tasks, total completion of taskp[2]. Virtual machine properties are bandwidth, memory, storage, unit cost of vm, number of vm. In this proposed algorithm the task is assign on the bases of task properties and virtual machine. In existing system task is assigned at randomly for a virtual machine. Through existing system some vm's does not have the high capacity for handling the particular weighted tasks. Virtual machine is an execution unit, it can be act as a base for cloud computing environment[5]t. Virtualization is a technology that helps to install various types of software in a single hardware. They are totally separated and independent with each other.So load balancing is a difficult task lead. The objective is to optimize the performance of vm with the combination of initial place time and run time placement load balancing through identifying the length of job[6]. the "job length" parameter can be help to schedule the job at right virtual machine ,at any position and it is able to deliver the responds in a very minimum make span.

II. RELATED WORK

The load balancing of task on virtual machines is an important characteristic of task scheduling in clouds. In present the cloud computing job scheduling mechanism has not yet forms a unified standard and norms .this proposed algorithm consider the task make span ,cost. The focus on virtual machine of load balancing, and proposed a cloud computing task scheduling algorithm based on improved particular algorithm[7-8]. That takes make span and total task completion cost, but does not consider the system load balancing.

A. Weighted Round Robin Algorithm:

The weighted round robin algorithm is one of the most popular and simplest algorithm in any field we consider. The user is always sure that the request processing will be simpler and faster when round robin is working for the Load Balancing goal[9]. Because of these feature there has been lot of research carried out to improve performance of this algorithm. There are so many variants of round robin algorithm available introducing different techniques focusing on different measuring parameters of it. When one wishes to work on or use Round robin algorithm, he must be familiar with its terminology:

- 1) Burst Time: BT is the time duration which a request requires to complete.
- 2) Time Quantum: TQ is the time duration for which a request is allowed to access a VM.
- 3) Arrival time: Time at which the process arrival in ready queue.
- 4) compilation time: Time at which process completes its execution.

III. PROPOSED ALGORITHM

```

WeightedRR( )
{
  Initialize ready_queue, BT list, TQ, VM_State list, round;
  While(ready_queue != NULL)
  {
    if ( round%2 == 0)
      TQ= min(BT list);
    else
      TQ= avg (BT list);
    Allocate VM to request in
    ready_queue, set VM_State to BUSY;
    Execute request;
    Deallocate VM and set VM_State to AVAILABLE;
    round++;
    New BT=BT-TQ;
  }
}

```

Fig: Pseudo code for Proposed algorithm

IV. FIGURE

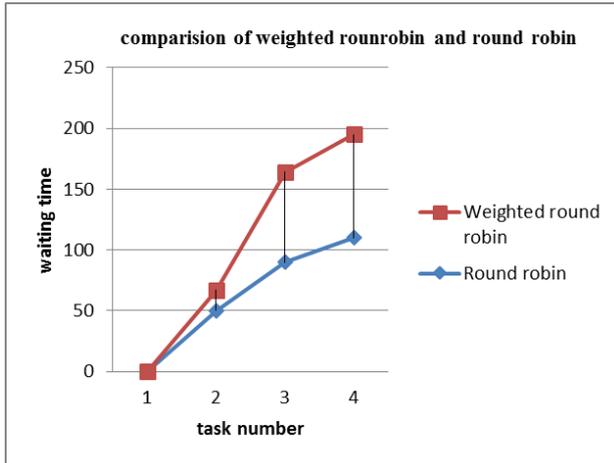


Fig. 1: Allocating of weights and time for task

Task	Completion time	Weight	At R1	At R2	At R2
T1	20	5	complete	Complete	Complete
T2	60	3	60	60	Complete
T3	30	4	30	Complete	Complete
T4	90	4	90	Complete	Complete

Table 1: Represents the completion time with weights for the tasks.

In proposed algorithm we already given the quantum time for the three taskst1,t2,t3,t4. Which are assigned to the only two virtual machines .the burst time, weights are allocated for the tasks, for calculating the turnaround time and average of turnaround time. Now the result for burst time is 20,60,30,50 and weighting time is 0,50,50,70.the turnaround time is 20,110,80,120, average turnaround time is 67.0.

Average waiting time = 30.333334
Average turn around time = 67.0
Same values are given for round robin algorithm now the average turnaround time is 70.0.

```

C:\mca>javac wrrr.java
C:\mca>java wrrr
Processes Burst Time Arrival Time Waiting Time Turn-Around Time Completion Time
1          20           0           0           20           20
2          60           3           17          77           80
3          30           6           74          104          110
Average waiting time = 30.333334
Average turn around time = 67.0
C:\mca>
    
```

Fig. 2: Representing the proposed algorithm result

The analysis of proposed algorithm is expressing the out put for given completion time for task on the bases of weights and allocating the time quantum .the weighted round robin is given the better result than round robin.

```

G:\mca>javac wrrr.java
G:\mca>java wrrr
Processes Burst Time Arrival Time Waiting Time Turn-
Around Time Completion Time
1          20           0           0           20           20
2          60           3           17          77           80
3          30           6           74          104          110
    
```

V. RESULT AND ANALYSIS OF PROPOSED ALGORITHM

Proposed algorithm is weighted round robin algorithm because it provides enough weight scheduling when the burst time of incoming request load is having great variance. Table 1 shows the request gets quick response as compared to normal round robin algorithm independent of its request size or Burst time. The example here also shows that the overall algorithm execution requires less number of rounds to follow thus the algorithm when applied to large number of request performs faster providing better response time to any request. WRR(Weighted Round Robin) algorithm thus provides weights to larger requests and smaller one also to the load coming at executing node in the cloud. In the table 1 each task will be arranged a in queue ,the all tasks are get ready to run on particular virtual machine which is suitable for the properties of task and virtual machine properties. The task properties are task completion time, weights of task, completion time for task and time quantum is assign for tasks. The virtual machine properties are bandwidth, memory, storage, capacity to handle the number of tasks per rounds. The weighted round robin algorithm is express the how the task is completed in particular assigned virtual machine.

```

C:\mca>javac RRR.java
C:\mca>java RRR
Processes Burst time Waiting time Turnaround time
1          20           0           20
2          60           50          110
3          30           50           80
Average waiting time = 33.333333
Average turn around time = 70.0
C:\mca>
    
```

Fig. 3: Representing the result for round robin algorithm
The analysis of round robin algorithm is given the poor results where compare to the Weighted round robin algorithm for the same completion time and weights.

```

G:\mca>javac RRR.java
G:\mca>java RRR
Processes Burst time Waiting time Turnaround time
1          20           0           20
2          60           50          110
3          30           50           80
Average waiting time = 33.333333
Average turn around time = 70.0
    
```

VI. CONCLUSION

In this work, the weighted round robin algorithm considers the capabilities of each VM and the task length of each requested job to assign the jobs into the most appropriate VMs[10]. This weighted round robin algorithms are having three different stages to handle the three different scenarios in the environment life cycle. The static scheduler algorithm pays attention to the initial placement of the jobs.

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